



(19)

(11) Publication number:

01223757 A

Generated Document

## PATENT ABSTRACTS OF JAPAN

(21) Application number: 63048833

(51) Intl. Cl.: H01L 27/04 H01L 29/80

(22) Application date: 02.03.88

(30) Priority:

(43) Date of application publication: 06.09.89

(84) Designated contracting states:

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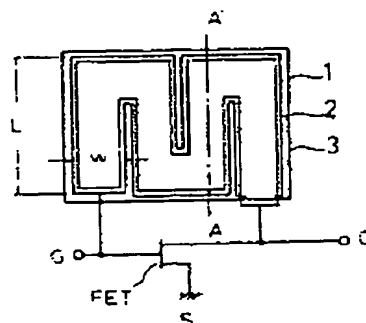
## (54) SEMICONDUCTOR DEVICE

(57) Abstract:

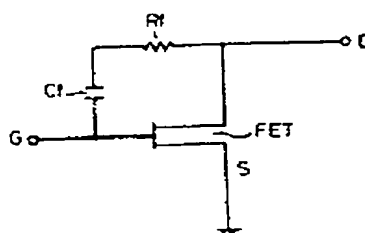
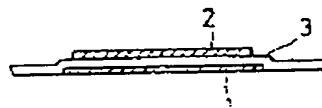
**PURPOSE:** To reduce the occupation area of an RC feedback circuit part and realize the high integrity of an MMIC by a method wherein the resistor part of an RC series circuit part is formed on one of the upper metal film or lower metal film of the MIM capacitor of the RC series circuit part by using a metal material for a thin film resistor.

**CONSTITUTION:** An RC series circuit part is composed of a resistor part and a capacitor part connected to each other in series and the resistor part is formed on at least one of the upper metal film or lower metal film 1 of the capacitor part composed of a metal-insulating film-metal(MIM) capacitor by using a metal material for a thin film resistor with a required resistance value. Thus the resistor part is unified with the MIM capacitor. A feedback capacitance of is given by an MIM capacitance determined by the area with which the lower metal film 1 and upper metal film 2 face each other, the dielectric constant of an interlayer insulating film 3 and the thickness of the film 3. Also, a feedback resistance  $R_f$  is determined by the width  $W$ , length  $L$  and sheet resistance value of the lower metal film 1 and upper metal film 2 with a meander shape. As the feedback resistor  $R_f$  is unified with the capacitor by the electrode of the MIM capacitor, the high integrity of the chip can be realized.

(a)



(b)



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